

$$30. \quad x = (2z + 14)$$

$$y = (3z + 15)$$

$$2x - 3 = 3y - z$$

$$2(2z + 14) - 3 = 3(3z + 15) - z$$



7.3 Solving Linear Systems by Elimination or Linear Combination

Edit

Reset

?

To solve equations with elimination:

1

Arrange terms in columns (STANDARD FORM... $Ax + By = C$)

2

Multiply or divide 1 or both equations to get opposite terms

3

Add equations from step 2 and solve

4

Sub value from step 3 into any equation and solve

5

Write answers as an ordered pair. Check solution with both equations.

Solve using elimination

$$1. \quad 4x + 8y = 20$$

$$+ \quad -4x + 2y = -30$$

$$\frac{10y = -10}{10 \quad 10}$$

$$y = -1$$

$$x = 7$$

$$(7, -1)$$

(7, -1)

Solve using elimination

$$\begin{array}{rcl} 2. & 8x + y = -16 & \rightarrow 8x + y = -16 \\ -1 \cdot (-3x + y = -5) & + (3x - y = 5) & \end{array}$$

$$\frac{11x = -11}{11 \quad 11}$$

$$\boxed{x = -1}$$

$$8(-1) + y = -16$$

$$\begin{array}{r} -8 + y = -16 \\ +8 \quad +8 \end{array}$$

$$\boxed{y = -8}$$

$$(-1, -8)$$

Solve using elimination

3. $-4x + 9y = 9$

$3(x - 3y = -6)$

$$\begin{array}{r} -4x + 9y = 9 \\ + 3x - 9y = -18 \\ \hline \end{array}$$

$$\begin{array}{r} -1x = -9 \\ \hline -1 \quad -1 \\ \hline \end{array}$$

$$\boxed{x = 9}$$

$$\begin{array}{r} 9 - 3y = -6 \\ -9 - 3y = -15 \\ \hline -3y = -15 \\ \hline y = 5 \end{array}$$



Solve using elimination

**4. $5x + 4y = -30$
 $3x - 9y = -18$**

$$(5x + 4y = -30)9$$

$$(3x - 9y = -18)4$$

$$45x + 36y = -270$$

$$12x - 36y = -72$$

$$\frac{57x}{57} = \frac{-342}{57}$$

$$x = -6$$

$$(-6, 0)$$

$$3(-6) - 9y = -18$$

$$-18 - 9y = -18$$

$$+18 \quad +18$$

$$\frac{-9y}{-9} = \frac{0}{-9}$$

$$y = 0$$

$(-6, 0)$

Did someone say "CHALLENGE?" OK!

5. $3 + 2x - y = 0$

$-3 - 7y = 10x$

$$\begin{array}{r} 2x - 1 = -3 \\ +1 \quad +1 \\ \hline 2x = -2 \end{array}$$

$$\begin{array}{r} 5(2x - 1 = -3) \rightarrow 10x - 5y = -15 \\ -10x + 7y = 3 \\ \hline -12y = -12 \\ \hline -12 \quad -12 \\ \hline y = 1 \end{array}$$

$$-10x + -7(1) = 3$$

$$-10x + -7 = 3$$

$$\begin{array}{r} +7 \quad +7 \\ \hline -10x = 10 \\ \hline -10 \quad -10 \\ \hline x = -1 \end{array}$$

$y = 1$ $(-1, 1)$